

Environmental Sustainability of Squatter Settlements in Yeka Sub City, Addis Ababa, Ethiopia

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ABSTRACT

The problem of squatter settlement is a global agenda; however, its magnitude is higher in developing countries. As one of the cities in developing nations, Addis Ababa has encountered a fast rate of squatter settlements which is resulted due to illegal construction of residential homes. The purpose of this study was to assess environmental sustainability of squatter settlements in Addis Ababa City. Descriptive type of research and qualitative research approach was applied. Both primary and secondary data source was used for data analysis. The finding identified factors that force people to settle illegally in squatter areas were poverty, inability to purchase land legally, absence of land provision by the government, less costly availability of farm lands and continuous increase in rental houses that makes a house unaffordable to low-income groups. Even though squatter settlements provide affordable houses for low-income groups the spread of poorly controlled settlement has resulted in many environmental problems. Uncontrolled settlement development is causing physical environmental degradation and pollution risks. Finally, City administration should formulate strategy to control fast land sprawl in the sub city, focus on preventive measures rather than reactive and formulate housing strategy that addresses the low-income groups.

Key words: Squatter, Illegality, squatter settlement, housing, environmental sustainability

1. INTRODUCTION

As per the proclamation of the Universal Declaration of Human Rights in 1948, the right to adequate housing has found explicit recognition as a basic human right. The right to adequate housing includes other basic rights such as access to water, sanitation and other infrastructure. The right to adequate housing is also mentioned in a number of international agreements (1989) and others.

Over 90% of urban growth is occurring in the developing World and for the future, the government of South Asia and Sub-Saharan Africa faced inability to meet the housing and infrastructure needs of the urban poor, suggesting that the absolute numbers of informal settlement dwellers in these regions will dramatically grow (HABITAT, 2016).

The definition of informal settlement is still elusive. Several synonymous words have been used by scholars to refer to informal settlements. These include Squatter settlement, spontaneous, irregular and unplanned (Lamba, 2005; Abunyewah et al., 2018). Some literatures have used the term slums and informal settlements interchangeably (UNHSP, 2003). The general definition of squatter settlements is settlements where land and/or building have been occupied without the

permission of the owner (UN Habitat, 2003). Globally, about one-third of the population lived in squatter settlement (Willis, 2009). The UNCHS (2003), estimated that between 40 and 70% of urban growth in developing countries is "informal. This figure is similar in Addis Ababa City with the housing stock located in unplanned areas or informal settlements (ORAAMP, 2001). Squatter settlements are the means of access to home for the poor inhabitants with insecure employment, squatter settlement occurs when the current land administration and planning fail to address the need of the whole community and exclusion of the poor from formal access to land. Informal land developments provide shelter for the majority of the population of urban dwellers in most developing countries (UNCHS, 1996 and 2000; D. Lasserre, Oluwafemi, 2015).

The urban poor tend to be the most vulnerable as they are often living in marginalized parts of the city, contiguous with waste sites and well beyond the reach of water, sanitation and other environmental services. The negative consequences of poor environmental quality impact every aspect of their lives as well as the livability and health of the community at large. Many parts of the world millions of people live in informal urban settlements especially in developing countries where lack of resources and inadequate infrastructural facilities lead to degradation of the environment (Oluwafemi, 2015). Mostly the squatter settlements are associated with developing countries and manifested by improper drainage and waste removal results pollution of water, air and soil. (Getalem Aychew Beyene and Yenew Amsal Dessie, 2014). In developing countries, lack of sewage and clean water, deforestation, and poor sanitation were of particularly high concern in informal settlements (P.P. Devi et al., 2017). Informal settlements are often marginalized from infrastructures, and thus deteriorated environmental resources (Saeed Maleki and Akbar Asghari Zamani, 2012; P.P. Devi et al., 2017).

Study conducted by (Shubira Kalugila, 2013), informal urbanization trends in sub-Saharan Africa shows Ethiopia to be the third country with highest population living in informal settlements next to Tanzania and Mozambique. In Ethiopian, urban centers practiced a fast squatter settlement growth. As one of the cities in the developing countries, Addis Ababa has experienced a rapid rate of expansion. This trend is largely influenced by the development of squatter settlements. The number and size of squatter settlements in Addis Ababa has been increasing over time and constitutes a considerable proportion of the total housing supply. This situation has aggravated the unplanned and rapid horizontal expansion led to increasing costs in terms of infrastructure and degradation of the environment. As being the capital city of Ethiopia, Addis Ababa absorbs high population concentration. The city faces acute and ever worsening housing shortage. Big backlogs, substandard physical substances and lack of infrastructure facilities mark the housing situation in Addis Ababa.

Informal settlements have been expanding at an alarming rate in the expansion areas of Addis Ababa. For instance, from 1984 to 1994 such settlements had been growing by 15.7% and the figure rose to about 30% in 2001 (ORAAMP, 2001). The same source reveals that the total informal housing units in the expansion areas alone are estimated to be 60,000 and housed a total population of 300,000. In similar manner, the total area supposed to be occupied by informal settlements is about 2000 hectares. High housing demand and supply gap encouraging the proliferation of squatter settlements in the city. According to Menwuyelet Melesse (2005) study, squatter settlements in Addis Ababa emerged as a result of many factors, such as the delay of the implementation of legal housing, delays of providing legal land provisions, increases of the cost of housing rent, political and legal failures that represent the absence of government actions to control open spaces,, the absence of inclusive legal responses towards the continuous appearance of the squatting phenomenon, and the lack of controlling and legalizing the practice of making profits from land sale by land speculators.

Informal settlements have been expanding at an alarming rate in the most expansion areas of Addis Ababa. From ten sub city very fast expansion area found in Yeka sub city. There are 13

woreda in the sub city, from these, large number of informal settlers found in all direction but especially wereda 9,10, 12 and 13 are the most expansion area. This study conducted Woreda 13; according to Yeka sub city" Sened Aleba" office head, this area is the most expansion and large number of informal settlers found there. Thus, the purpose of this study was to assess the status, causes, characteristics and environmental impacts of squatter settlements in Addis Ababa city particular reference to Yeka sub-city.

2. MATERIALS AND METHODS

2.1 Description of the Study Area

Addis Ababa is located in the central parts of Ethiopia and geographically lies 9°1'48' 'N latitude and 38°44' 24' 'E longitude. The city covers a total area of 540 Sq.Km (AABFED, 2013). Its altitude ranges from 2, 100 meters at Akaki in the south to above 3000 meter above sea level in Entoto Mountain in the north. This makes Addis Ababa the third highest city in the world, after La Paz and Quito in Latin America (AABFED, 2013). Addis Ababa is the only primate city that dominant political, economic and historical city of the country established in 1887 by emperor Menilik II. It has the status of both a city and a state. It is the capital of federal government and the set of African Union. It also hosts the headquarters of the United Nations Economic Commission for Africa (UNECA) and numerous other multinational and international organizations. It is the largest city in Ethiopia. The population of the city in 2011 was 3,061,404 from this Male 1,395,378 and Female 1,666,026 which has 783,439 house hold (CSA, 2012). The city accounted for 32.27% of the total urban population of the country. With the current population growth rate of 3.8 % the city population is estimated to reach 9.8 million in 2037 and experienced urban land expansion rate 3.2% per year (WB, 2015).

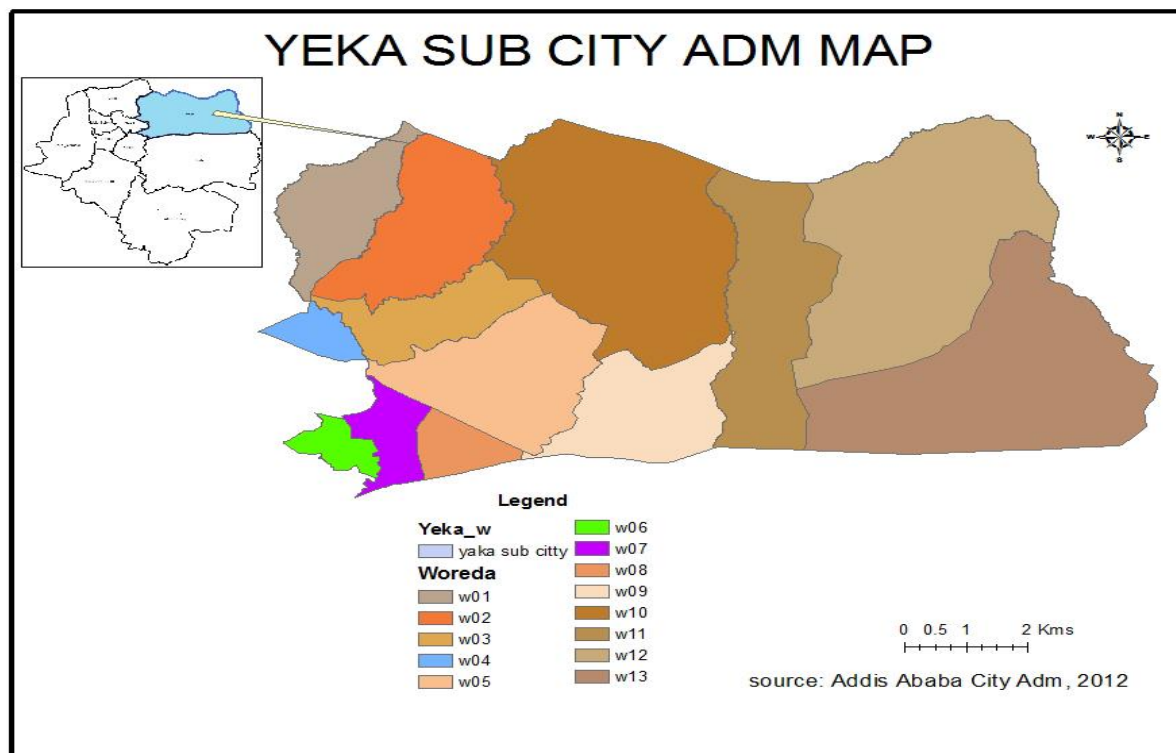


Figure 1. Map of the study area with Specific site of Yeka sub city, Woreda 13

Its administrative structure is divided in to three tiers of government arrangement, the city administration level being the highest tier, a middle level which accountable to the city administration the name is called sub city and the wereda level which is the lowest administrative hierarchy which has smaller number wereda 10 to larger wereda 13 in number under each sub city and currently totaling has 116 weredas. The city divided in to 10 sub-cities, namely Addis

Ketema, Akaki-Kality, Arada, Bole, Cherkos, Gullele, KolfeKeranio, Lideta, Nefas Silk Lafto, and Yeka. From these sub-cities, five sub-cities Akaki-Kality, KolfeKeranio, Nefas-silk-Lafto, Bole and Yeka have suburban areas. Yeka Sub-City is one of the ten sub cities of Addis Ababa city Administration, which is situated in north-eastern part of the city, bounded from south by Bole Sub City, from west by two Sub Cities called Gullele and Arada, from south-west by Kirkos Sub City and from north and east by special Zone of the Oromia National Regional State.

The Yeka Sub City covers 8213.11 hectares, constitutes 15.8 % of the total land area of the city which makes it 3rd huge Sub City next to Bole and Akaki and the 7th densely populated Sub City from the ten Sub Cities of Addis Ababa. The total population of the Sub City is 346,664. The sub city has 13 Woredas. Woreda 13 was chosen as a case area for it has the highest rank in the practice of expansion, the population number of the woreda was 55,035,123 from which the male population accounts for 26,241 which was 47.7% of the total population, and the female totaled about 28,794 which was 53.3% (CSA, 2007). Squatter settlements were mainly located in the peripheral areas of the city. Yeka Sub City was selected purposively due to its rapidly expanding areas in the city and where squatter settlements are more prevalent. Thus, the study was conducted three areas of the Sub City Include: Kara, Gewasa and Asho.

2.2 Sources of Data and Method of Data Collection

The researcher used both primary and secondary sources. In order to achieve the objectives of the study, the data collection instruments like observation and interview check list employed for the primary data sources. In addition to this, secondary data was also used.

2.2.1 Interviews

Based on the likely data availability, the researcher took a total nine officials who have a deeper and better knowledge about the issue and eight informal settlers on the area of study have given their opinions. The interviewee includes Yeka Sub city Land management head, Sub city "Sened Aleba" head, sub city beautification office head, land banking office head, Woerda 13 building permit expert and four experts and Eight informal settlers from three sites. It also enabled to informal interview with different people who were not related to the area but could still give relevant information.

2.2.2 Direct Observation

The researcher has visited the research areas. Three day was dedicated to each research areas. During the field work the researcher was directly observing the status and the existing condition of informal settlements and also used photographs as source of data.

2.2.3 Document Review

Systematic review of relevant books, research journal articles and related literature has been done. Different policies and strategies of the country regarding to causes, characteristics, status and environmental impact of squatter settlement and others were found from different sources. Then, the articles and standard literatures have been read critically and synthesize the information to triangulate the study and to produce sound scientific paper.

3. RESULT AND DISCUSSION

3.1 Housing Conditions in Addis Ababa City

The city has experienced rapid and unplanned urban growth that is adversely affecting the environment. The features of Addis Ababa are dominant of informal housing, concentration of slum dwellings, poor housing, infrastructure and sanitary development and deteriorated environment. Informal housing accounting for 80 per cent of total housing supply and total housing stock comprising of low quality housing 70%-- 80 % (WB, 2015). More than 26 percent of the formal houses have no toilet facility, 33 percent of households share toilet with more than six families, 29 percent has no separate room for cooking, 34 percent of the residents depend on water from frequently interrupted public taps (UN-HABITAT, 2008). Only 7 percent of the houses

have connection to the municipal sewer line and 25 percent of the residents have no any access to any kind of sanitation facility (UN-HABITAT, 2008). Only 10% of the city area is covered by a sewerage system (Alebel, 2014 and WB, 2015). More than 35 percent of the solid waste generated by the city is not collected (UN-HABITAT, 2017). River, soil, air and water pollution as a result of industrial wastes, are poorly managed, and are becoming growing concerns in Addis Ababa. Waste generated by the city is dumped into rivers, ditches, roadsides, and other open space.).

3.2 The Existing Situation of Squatter Settlement in the city

The Settlement has different names in different countries. In the Addis Ababa case these types of settlements are known as "Yechereka Bet". The term Chereka bet in its literal translation means "moon light housing" implying the illegal construction of houses is done at nights. The settlements are built without having construction permit given by city governments. The Addis Ababa Development and Improvement Project office (AADIPO, 2001) uses the following working definition for informal settlement. *Informality includes any form of construction (such as houses, fence, notice board, sewerage lines, containers, temporary/movable kiosks, etc...) which have been erected or built on public lands without having legal basis. Furthermore, it also includes any unauthorized expansion/ encroachment made on public rental houses. However, the degree of informality/illegality varies: some can be totally informal where as others can only be partially informal.*

According to the study conducted by the Urban Development and Works Bureau in the year 2000, the total area covered by squatter settlements accounts for 20% of the total housing stock of the city and the total area occupied by squatter settlements was estimated at 13.6% of the total built-up area. Besides, according to the report of city Administration, in 2009 there were many unidentified squatter settlements in the city occupied by the residents in the present time (Addis Ababa City Administration, 2010). The following table shows the extent of informal settlements in different parts of the city before 2002.

Table .1 The Location of Squatter Settlements

Location	Area in Hectares
Kotebe (kara-Alo) along both sides of the Dessie Road	112.5
Kotobe	81.25
Kotobe	62.5
Kotobe (Yeka)	48.75
Reppi	138.75
Jimma road on the right side of the road to Sebeta	228.13
Ayer Tena the settlements around the UDPO housing project	115.63
Hanna Mariam along the left and right side of the ring road	288.13
Kaliti around the waste water treatment plant (along the river)	62.5
Nefas silk WorkuSefer	95.00
South of WorkuSefer	38.75
North of WorkuSefer (Adjacent to Bole Bulbula)	80.00
Gourd Shola (south of transport ministry workers residence	81.25
CMC (North of the special housing project)	350.00
Meri(south and northern part of the road to Ayat)	90.63
Total	1,792.52

Source: ORAAMP, 2002

Squatter settlement/ Yechereka bet in the study area mostly found in outer skirt part of the city. Squatter settlements in Yeka Sub-City, between year 2005 and 2012 more than 914 houses were built on 47,000 square meters of land (Sirgut Gezahegn, 2013). According to Yeka sub city" Sened Aleba" office head, the main reasons for the proliferation of squatter settlements and unplanned expansion of at the peripheries of the Addis Ababa city are that peasants around the city provide urban land to individuals for housing construction without the consent of the concerned legal urban authorities. The people of informal settlement are not recognized by public authorities as an integral part of the city and they ignored from physical and social infrastructure like: water supply, sanitation, electricity, roads, drainage, schools and health centers that affect both the health of the residents and the environment.

The construction of informal house does not much with city master plan and the houses are low standards. According to the interview conducted with dwellers and observation, majority of the houses are constructed with wood and mud and most of the houses are a single room. Most of houses are constructed hill, gully and waste disposal sites areas that dangerous both the residents and the environments.

Housing type in different sites of the city



Housing Status in Gwasa and Asho site



Status of Toilet and Kitchen in Gawasa and Asho site

Majority of the houses have toilet and kitchen covered by plastics. They are low standards. There is no bath room.

Status of Toilet and Kitchen in Gawasa and Asho site

Availability of Water



The figure below that, there are common tap water (bono) remote from informal settlers. The bono constructed in formal settlements sites. To get water people go very far distance from their home for about 3 kilometers especially Gewasa site. During interview time with informal settlers to fetch water from tap (bono) women carry at the back and some residents use donkey 4 birr per jar, it is costly. Availability of water is severe problem not only informal but also formal settlers in Gawasa and Asho, because water released within a week or two weeks. In all sites there is no pipeline in individual compound in informal settlement. Squatter settlers in Gewasa site use water from river for drinking which are not clean and as a result there are cases of water-borne diseases.



Status of Pip (bono) Water in Gawasa, Kara (Bere tera)

Status of Electricity

There is no private power connection in informal settlements, Absence of electricity forced residents to get electricity from the nearest area illegally. According to the dwellers, the electricity is used only for light. However, they cannot use for cooking. The power also less and monthly payment is high. Squatter Settlers used wood and charcoal for cooking by cutting trees from the surrounding areas that destroy the forest.

Status of Road, Sewerage Line, Drainage, School, Health Center and other

Because of ignorance of their existence in city formal planning, the settlers have no roads, sewerage and drainage line. Similarly, they claimed that they do not have health center and school. They send their children to school for very far from their home.

Characteristics of Squatter Settlements

Legal Characteristics

Interview obtained from Yeka sub city" Sened Alba" office head, in 1988 and 1997 E.C by using Arial photograph, the city administration identified the informal coverage of the city. Because of the size of informal settlements has been increasing, the measures of demolishing are not feasible. This forced the city administration gives recognition to part of squatter settlements specifically those built upon 1996. In 1997 the government legalized compliance with the master plan. The

sub city" Sened Alba" office responsibility is now preparing legal document that include in 1997 master plan. After 1997 E.C, large number of houses constructed illegally. Those settlers are informal and the Sub city cannot provide infrastructures and services.

The office head added that in the present time. there are no clear data about the informal settlement. For the future, to know the data the city administration will use aerial photograph and by using GIS and AutoCAD, it can get the real data and the Addis Ababa city cabinet, decided either demolish or regularize by looking the magnitude of the data. In the present time, demolishing is the measure to control informal settler. In the study area, the lands occupied by informal dwellers are agricultural land. Farmers have sold their farming plots piece by piece to the squatters. The holding of the land is therefore illegal since it is used for purposes other than the intended function, which is agriculture. It is also illegal in that it contravenes the constitutional principle that prohibits land sale.

Physical Characteristics

According to woreda 13 building permit office expert, all houses in the study areas are substandard do not comply with local building and planning codes. During my observation most of the houses has been constructed from wood and mud. All of the houses are lack of infrastructures and services. Mostly they lived in environmental hazard area.

Social Characteristics

According to interview held with informal settlers, the men engaged in daily laborers in the city centers and construction sites where as women are house wives and take care of children. They have 3_5 children and low-income groups. Low interaction about different social issue in the area.

Major Causes of Squatter Settlement

Different Literatures show different causes for the formation of informal settlement. It is true that informal settlements occur when the existing land administration and planning system fails to address the needs of the whole residents. When the system fails to address the needs of housing, then people use their own paths to land for residential housing. Such settlements are characterized by rapid and unplanned development.

Addis Ababa accounts for about 30% of the country's urban population. Because of faster rate of urbanization, high population concentration occurred in the city, it is facing many challenges, one of which is the slow provision of houses for its residents which led to high gap between housing supply and demand encouraging the proliferation of squatter settlements. Squatter settlements in Addis Ababa emerged as a result of many factors. According to (Menwuyelet, 2005), the major factors include: the delay of the implementation of legal housing, delays of providing legal land provisions, and increases of the cost of housing rent. Besides those, he added that economic factors, there are political and legal failures that represent the absence of government actions to control and arrange open spaces, the lack of code enforcement service to regulate and control the appearance of illegal house construction, the absence of inclusive legal responses towards.

According to (Danile, 2006), there are two major views regarding to the causes of informal settlements in Addis Ababa. The first view is the perception held by many literatures, generally perceives informal settlements as "poverty driven" settlements, which have evolved due to a number of socioeconomic and institutional problems. Informal settlements, according to this view, are self- built settlements occupied by people living in the situation of poverty. The second line of view, which has been emphasized by the city government of Addis Ababa , is that most of the informal settlements found in the expansion areas of the city are "non - poverty driven "in character. The main essence of this view is, informal settlers in the expansion areas have occupied large plots (on the average 300sq.m) and close to 70% of them have good services (water, electricity, access road and in some cases telephone). In terms of income, most of the settlers are "middle to high income groups' and speculators. In this view informality is not considered as the only domain of the poor; it is also an area of strong groups, who have power and influence. On

the bases of this assumption, therefore, the city government was emphasizing, demolition" as a major corrective measure and as the result thousands of housing units were demolished in the past.

Table. 2 Demolished informal settlements in different areas

Location	Area in hectare
Kotebe (Kara-Alo) along both sides of the Dessie road	112.5
Kotebe (Yeka)	48.75
Reppi (Kolfe-keraniyo)	228.13
Hanna Mariam along the left and right side of the ring road	288.13
Kaliti around the waste water treatment plant (along the river)	62.5
South of Worku Sefer	38.75
Meri (south and northern part of the road to Ayat)	90.63
Total	869.39

Source: (Daniel, 2006).

In General, the following may be some of the pushing factors for the housing need in the city.

Population Growth and Inefficient Land Provision

Because, of natural increase and migration the Addis Ababa city currently undergoing rapid urbanization. Formally the population data of Addis Ababa was available for the first time in 1961. The total population as that time was 443,728 and this was followed by 683,530 in 1967. In 1978 and in 1984, continued showing growth. In 1994 it was 2,112,737 (Central Statistics Agency, 1999). In 2007 it was 2,738,248. With the current population growth rate of 2.1% the city population is estimated to reach 5 million after 10 years (CSA, 2007). The land supply in the city Administration is however tragically inefficient. The city Administration is currently unable to meet the demand of all the land requests. Information obtained from Woreda 13 building permit office expert until 1996 EC city government has provided thousands of plots to residents especially through cooperatives approach, after 1996 the government shift to condominium housing provision approaches. More than million residents wait since 1997. The above expert assured that, the land supply practice in Addis Ababa in the present system is leasing. The land supply in the city is however inefficient. The low-income group excludes from this lease system. The city government is currently unable to meet the demand of housing. Because of the shortage of land supply in the city people may force to construct houses illegally through purchase land from peasant farmers to hold land.

Institutional and Governance failure

The formal institutions are failing to address informal dwellers and that are not reflected on maps, where waste is not collected, where taxes are not paid and where public services are not provided. As illegal or unrecognized residents, many of these slum dwellers have no property rights, nor security of tenure. According to the UN-Habitat report on global human settlement, slums and urban poverty are not just a manifestation of a population explosion; it must be seen as the result of a failure of housing policies, laws and delivery systems, as well as of national and urban policies. The housing policy fail's at all levels – global, national and local (UN-Habitat, 2003). The organization structured starting from the sub city Sened Alba office to in the Woreda level " Demeb Askebari" offices that control and demolish informal settler.

Urban Poverty

The incomes of informal settlers are mostly too low for formally regulated markets to provide them with any kind of permanent housing. Hence, they choose another option to live either to building informal housing or live informal rental accommodation for each other (Daniel, 2011). One of the inhibiting factors is that the poor have a low propensity to save and hence a low propensity to borrow money from lending institutions. This situation has also been compounded by the increases in inflation levels. Hence, they have acted to solve their own problems by building their own dwellings, or by building informal rental accommodation for each other. Indeed, the

majority of the people interviewed fall under the category of there is no means to get formal land from the government. Two women who have been living in the city for more than 15 years claimed that after she received a chance to buy condominium house from the government, the down payment she was asked to pay was unrealistically high compared to her ability.

The other related issue is non-affordability of rent in the city. Most of the people also complained that the non - regularized rental practice in the city forced them to search for whatever type of shelter but theirs. Those people with family members are especially forced to pay a rent higher than their income. Moreover, the behavior and conduct of land lords are beyond one's ability to accept. Excessive restrictions were made on their use right in different ways such as restriction on the use of water, electricity, toilet services and even receiving and entertaining of relatives.

Farmers Ownership of the Land

In all study areas, during interview from informal dwellers, the settlers purchase land from farmers. Therefore, the settlers get land easily from private land owner. The original holders of the farm land have also participated in the construction of the informal settlements. Their intention is to rent it out to other settlers or to hold a house for future regularization purpose. This situation aggravates the formation of informal settlement in the study area. Interview with sub city land banking office head, the land bank is including only open space owned by government, it does not include agricultural land.

Environmental Consequences of Squatter Settlement in the Study Area

Even though squatter settlements provide affordable houses for low-income groups the spread of poorly controlled settlement has resulted in many environmental and health related problems. Uncontrolled settlement is causing physical environmental degradation and pollution risks and from personal observation as well as the interviews made the following possible threats are identified as consequences:

Disposal of Solid and Liquid Wastes

A Squatter settlement, due to its inherent non-legal status, has services and infrastructure below the adequate or minimum levels. Informal settlers mostly engaged in environmental hazard areas like hill, gorges, waste disposal sites, nearer to industrial areas. In the study areas, especially Kara is nearer to the market place of oxen, goat, sheep and other animals. This big market is a great source of wastes included; animal food and wastes, dead animals, plastics, papers, and others disposed to this area and there is bad odor in the area that affect both the health of the residents and environment (see figure below). Interview conducted with Yeka sub city beautification office head Said, the office give service both for formal and informal sites. However, most of informal areas have not road access that enters the cart, because of that, they exclude from this service. Regarding to Kara (Bere Tera), the waste collectors clean the asphalt (Dessie road) but, the inner part of the market is not included. Due to lack of established collection points, piles of garbage are scattered in and around residential areas, the problem of liquid and solid wastes is more severe in the informal settlement areas which leads to environmental and health problems (UN- Habitat, 2009).

Wastes nearer to informal settlers in Kara (Bere Tera)



Wastes disposed in forest area in Kara and Agricultural land in Asho site



As we have seen the above plates , wastes from the city also disposed to forests nearer to informal settlers and women were complaining of some asthmatic problems because of the smell. In addition, Peoples prefer to use the natural forest as a toilet that pollutes the environment.

3.3 Water scarcity and pollution

Expansion of the informal settlements has been loss of vegetation around water sources reduces water flow while poor disposal of liquid and solid wastes causes water pollution. The major cause for pollution of ground water sources on the periphery of the cities are growth of informal settlements, for example, in Zanzibar COLE (1995).

Water pollution affects individual, community, local and global ecosystem. In urban areas it is mainly occurred due to informal encroachment of land. Ali and Suleiman (2006) pointed out the expansion of human informal settlements has been the major cause for pollution of ground water sources. Loss of vegetation around water sources reduces water flow while poor disposal of liquid and solid wastes cause water pollution. They have been frequenting out breaks of water borne diseases like cholera dysentery, typhoid fever, skin infection, gastro enteritis, diarrhea, etc during high rainfall season due to contamination of drinking water over flow or filling up of toilet.

3.4 Encroachment of Forest Land

The study areas, especially Kara (bere terea) area covered with forest. But at this time, the middle of this area is covered with houses and there is a threat of deforestation by the settlers.

Forest area changed in to residential in Kara



3.5 Living in Mining and factory area

The following figure shows that many quarry sites are practiced in Gawasa and Asho sites. The dwellers have settled in these deep Gully areas that are difficult to live in the future. Moreover, informal dwellers live very near to factory in Gawasa site, marble factory. Huge dusts release from this factory in the surrounding environment that affect the health of the dwellers.



Query site Asho and factory Area nearer to Gwasa

3.6 Health Impacts of Informal Settlements

According to (UN Water Aid, 2006), more than 40% of the total number of deaths of women and children related to unsafe water, inadequate sanitation facilities and poor hygiene behavior. Women are affected disproportionately by lack of access to clean water and basic sanitation and are at higher risk of exposure to water and sanitation-related diseases. Around 1.3 billion women and girls in developing countries live without access to private, safe and sanitary toilets. Women without toilets can spend a considerable time each day queuing for public toilets or seeking private spots to defecate, during which time they put themselves at risk from rape or other violence (UN Water Aid, 2006).

4. CONCLUSION

The study attempted to investigate the existing situation, causes and impacts of squatter settlement in environment. Factors that force people to settle illegally in squatter areas was poverty and inability to purchase land legally, the absence of land supplied by the government, the less costly availability of farm lands and the higher and continuous increase in rental houses. The major problems in the study area are the inaccessibility of physical and social infrastructures. The houses of squatters are low standard. The settlements have the potential of creating environmental pollution and being sources of health problems because of the existence of inappropriate waste management. Therefore, City administration should capacitate itself and formulate strategy to control fast land sprawl, focus on preventive measures rather than reactive.

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